

Claims

We claim:

- 5 1. A condenser assembly adapted to condense a refrigerant for use in a retail store refrigeration system, the condenser assembly comprising:
- at least one microchannel condenser coil including an inlet manifold and an outlet manifold, the inlet manifold having an inlet port for receiving the refrigerant, and the outlet manifold having an outlet port for discharging the refrigerant; and
- 10 a frame supporting the condenser coil.
2. The condenser assembly of Claim 1, further comprising at least one fan supported by the frame, the fan being configured to generate an airflow at least partially through the microchannel condenser coil.
- 15 3. The condenser assembly of Claim 1, wherein the microchannel condenser coil includes a plurality of cooling fins spaced thereon between 12 and 24 fins per inch.
4. The condenser assembly of Claim 1, wherein the microchannel condenser coil
- 20 includes a plurality of microchannels fluidly connecting the inlet manifold and the outlet manifold, the microchannels measuring between about 0.5 mm by about 0.5 mm and about 4 mm by about 4 mm in cross-section.

5. A condenser assembly adapted to condense a refrigerant for use in a retail store refrigeration system, the condenser assembly comprising:

a first microchannel condenser coil configured such that the refrigerant makes at least one pass therethrough;

5 a second microchannel condenser coil fluidly connected with the first microchannel condenser coil, the second microchannel condenser coil being configured such that the refrigerant makes at least one pass through the second microchannel condenser coil after making at least one pass through the first microchannel condenser coil; and

a frame supporting the first and second microchannel condenser coils.

10

6. The condenser assembly of Claim 5, further comprising at least one fan supported by the frame, the fan being configured to generate an airflow at least partially through at least one of the first and second microchannel condenser coils.

15

7. The condenser assembly of Claim 5, wherein at least one of the first and second microchannel condenser coils include a plurality of cooling fins spaced thereon between 12 and 24 fins per inch.

20

8. The condenser assembly of Claim 5, wherein at least one of the first and second microchannel condenser coils include a plurality of microchannels fluidly connecting the inlet manifold and the outlet manifold, the microchannels measuring between about 0.5 mm by about 0.5 mm and about 4 mm by about 4 mm in cross-section.

25

9. The condenser assembly of Claim 5, wherein the first and second microchannel condenser coils each include an inlet manifold and an outlet manifold, and wherein the outlet manifold of the first microchannel condenser coil is fluidly connected with the inlet manifold of the second microchannel condenser coil.

5

10. The condenser assembly of Claim 9, wherein the respective inlet manifolds each include at least one inlet port, and the respective outlet manifolds each include at least one outlet port, and wherein the outlet port of the first microchannel condenser coil is coupled to the inlet port of the second microchannel condenser coil.

10

11. The condenser assembly of Claim 5, wherein the second microchannel condenser coil is in a fluid series connection with the first microchannel condenser coil.

15

12. A condenser assembly adapted to condense a refrigerant for use in a retail store refrigeration system, the condenser assembly comprising:

a first microchannel condenser coil configured such that the refrigerant makes at least one pass therethrough;

5 a second microchannel condenser coil configured such that the refrigerant makes at least one pass therethrough;

an inlet header fluidly connected with the first and second microchannel condenser coils, the inlet header being configured to deliver the refrigerant to the first and second microchannel condenser coils;

10 an outlet header fluidly connected with the first and second microchannel condenser coils, the outlet header being configured to receive refrigerant from the first and second microchannel condenser coils, wherein the first and second microchannel condenser coils are connected to receive and deliver refrigerant in a parallel relationship between the inlet and outlet headers; and

15 a frame supporting the first and second microchannel condenser coils.

13. The condenser assembly of Claim 12, further comprising at least one fan supported by the frame, the fan being configured to generate an airflow at least partially through at least one of the first and second microchannel condenser coils.

20

14. The condenser assembly of Claim 12, wherein at least one of the first and second microchannel condenser coils include a plurality of cooling fins spaced thereon between 12 and 24 fins per inch.

15. The condenser assembly of Claim 12, wherein the first and second microchannel condenser coils each include an inlet manifold and an outlet manifold.

16. The condenser assembly of Claim 15, wherein the inlet and outlet manifolds of the first and second microchannel condenser coils are fluidly connected by a plurality of microchannels, the microchannels measuring between about 0.5 mm by about 0.5 mm and about 4 mm by about 4 mm in cross-section.

17. The condenser assembly of Claim 15, wherein the inlet manifolds of the first and second microchannel condenser coils are fluidly connected with the inlet header.

18. The condenser assembly of Claim 17, wherein the inlet manifolds of the first and second microchannel condenser coils each include at least one inlet port, the at least one inlet port of the first microchannel condenser coil being coupled to the inlet header, and the at least one inlet port of the second microchannel condenser coil being coupled to the inlet header.

19. The condenser assembly of Claim 15, wherein the outlet manifolds of the first and second microchannel condenser coils are fluidly connected with the outlet header.

20. The condenser assembly of Claim 19, wherein the outlet manifolds of the first and second microchannel condenser coils each include at least one outlet port, the at least one outlet port of the first microchannel condenser coil being coupled to the outlet header, and the at least one outlet port of the second microchannel condenser coil being coupled to the outlet header.

21. A method of assembling a condenser assembly adapted to condense a refrigerant for use in a retail store refrigeration system, the method comprising:

providing a first microchannel condenser coil configured such that the refrigerant makes at least one pass therethrough;

5 fluidly connecting the first microchannel condenser coil to a second microchannel condenser coil configured such that the refrigerant makes at least one pass through the second microchannel condenser after making at least one pass through the first microchannel condenser coil; and

supporting the first and second microchannel condenser coils with a frame.

10 22. The method of Claim 21, further comprising positioning at least one fan over at least one of the first and second microchannel condenser coils, the fan being configured to generate an airflow through the at least one of the first and second microchannel condenser coils.

15 23. The method of Claim 21, wherein fluidly connecting the first microchannel condenser coil to the second microchannel condenser coil includes coupling an outlet port of the first microchannel condenser coil with an inlet port of the second microchannel condenser coil.

20 24. The method of Claim 21, further comprising:
calculating a total heat load of the refrigeration system; and
determining how many microchannel condenser coils should be fluidly interconnected.

25. A method of assembling a condenser assembly adapted to condense a refrigerant for use in a retail store refrigeration system, the method comprising:

providing a first microchannel condenser coil configured such that the refrigerant makes at least one pass therethrough;

5 providing a second microchannel condenser coil configured such that the refrigerant makes at least one pass therethrough;

fluidly connecting an inlet header to the first and second microchannel condenser coils, the inlet header being configured to deliver the refrigerant to the first and second microchannel condenser coils;

10 fluidly connecting an outlet header to the first and second microchannel condenser coils, the outlet header being configured to receive the refrigerant from the first and second microchannel condenser coils, wherein the first and second microchannel condenser coils are connected to receive and deliver refrigerant in a parallel relationship between the inlet and outlet headers; and

15 supporting the first and second microchannel condenser coils with a frame.

26. The method of Claim 25, further comprising positioning at least one fan over at least one of the first and second microchannel condenser coils, the fan being configured to generate an airflow through the at least one of the first and second microchannel condenser coils.

27. The method of Claim 25, wherein fluidly connecting the inlet header to the first and second microchannel condenser coils includes coupling respective inlet ports of the first and second microchannel condenser coils to the inlet header.

28. The method of Claim 25, wherein fluidly connecting the outlet header to the first and second microchannel condenser coils includes coupling respective outlet ports of the first and second microchannel condenser coils to the outlet header.

5 29. The method of Claim 25, further comprising:
calculating a total heat load of the refrigeration system; and
determining how many microchannel condenser coils should be fluidly
interconnected.

10